Training manual

WHO Package of Essential NCD Interventions (PEN)

Management of
Chronic Respiratory Diseases.

Centre for Community Medicine
All India Institute of Medical Sciences
New Delhi, India

WHO Collaborating Centre for Capacity Building and Research
in Community-based Noncommunicable Disease Prevention and Control

Training Manual

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Management of Chronic Respiratory Diseases

1. Asthma
2. Chronic Obstructive Pulmonary Diseases (COPD)

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CHRONIC RESPIRATORY DISEASES

Chronic respiratory diseases (CRDs) are chronic diseases of the airways and other structures of the lung. It includes many chronic respiratory ailments such as COPD, asthma, occupational lung diseases, interstitial lung disease and others. PEN focuses particularly on bronchial asthma and chronic obstructive pulmonary disease (COPD), which are major public health problems accounting for a significant burden in low- and middle-income countries

Asthma

1. ASSESS

Risk factors of Asthma

Non-modifiable risk	Modifiable risk
Age: Onset of asthma is more common in younger age group History of atopy: eczema, recurrent sneezing, itchy/watery eyes Family history of asthma or atopy Genetic	Indoor allergens: house dust mites, animal proteins (eg, mouse, cat, and dog allergens), cockroaches, and fungi Tobacco smoke Outdoor and indoor air pollution Respiratory viral infections Occupational dust (industrial) exposure

Symptoms of asthma

Cough
- Difficult breathing
- Chest tightness
- Wheezing

2. DIAGNOSE

The following features make a diagnosis of ASTHMA more likely:

■ previous diagnosis of asthma;
■ symptoms since childhood or early adulthood;
■ history of hay fever, eczema and/ or allergies;
■ symptoms triggered by respiratory infection, exercise, weather changes or stress;
■ intermittent symptoms with asymptomatic periods in between;
■ symptoms worse at night or early morning;
■ symptoms respond to salbutamol.

3. TREATMENT

Pharmacological Treatment

A stepwise approach is recommended as follows

1. Inhaled salbutamol prn (when necessary)
2. Inhaled salbutamol prn plus low-dose inhaled beclometasone, starting with 100ug twice daily for adults
3. Add low-dose oral theophylline to Step 3 treatment (assuming long-acting beta agonists and leukotriene antagonists are not available)
4. Add oral prednisolone, but in the lowest dose possible to control symptoms (nearly always less than 10mg daily)

IMPORTANT: Check the patient's adherence to treatment and observe their inhaler technique

4. REFER

The patient should be referred in the following conditions:

- When asthma is poorly controlled
- When the diagnosis of asthma is uncertain
- When regular oral prednisolone is required to maintain control

5. FOLLOW UP

Patient and family education should be provided

- Advise the patient to carry the device always
- Emphasize the need for adherence to drugs.
- Advice regarding dealing with triggers

6. ACUTE EXACERBATION OF ASTHMA

The following patients have a high risk of future exacerbations and may have a poor asthma outcome.

Risks for exacerbation

- Uncontrolled asthma symptoms
- One or more severe exacerbation in previous year
- Start of the patient's usual 'flare-up' season
- Exposures: tobacco smoke; indoor or outdoor air pollution; indoor allergens
- Major psychological or socio-economic problems for child or family
- Poor adherence with controller medication, or incorrect inhaler technique

Management of Asthma exacerbation

- Prednisolone 30–40mg for fve days for adults and 1mg per kg for three days for children, or longer, if necessary, until they have recovered;
- Salbutamol in high doses by metered dose inhaler and spacer (e.g. four puffs every 20 minutes for one hour) or by nebulizer;
- Oxygen , if available, if O_2 saturation levels are below 90%)

Notes

Chronic Obstructive Pulmonary Disease (COPD)

1. ASSESS

Risk factors for COPD

- Tobacco smoking in all forms
- Environmental tobacco smoke
- Exposure to biomass fuel smoke
- Occupational exposure
- Outdoor air pollution
- Pulmonary TB
- Poorly treated asthma
-

Symptoms of COPD

The initial suspicion of COPD is based on the presence of risk factors and symptoms. Based on this, further investigations may be required to confirm the diagnosis of COPD and to refute other possible alternate diagnosis (eg. Pulmonary TB, bronchiectasis)

Symptoms suggestive of COPD	Symptoms suggesting alternate diagnosis
Progressive difficulty in breathing	Chest pain
Chronic cough (> 8 weeks)	Fever
Chronic sputum production	Significant weight loss
Exposure to risk factors • Tobacco smoke • Biomass fuel • Occupational exposure	Orthopnoea
	Symptoms worsening at night
	Haemoptysis

2. DIAGNOSE

Diagnosis of COPD is made based on the following symptoms

Features suggestive of COPD
The following features make a diagnosis of COPD more likely: ■ previous diagnosis of COPD; ■ symptoms start in middle age or later (usually after40); ■ history of heavy and prolonged exposure to burning fossil fuels in an enclosed space, or high exposure to dust in an occupational setting; heavy smoking, i.e. >20 cigarettes per day for >15 years; ■ symptoms worsen slowly over a long period of time; ■ symptoms that are persistent with little day-to-day variation. ■ long history of daily or frequent cough and sputum production; starting before shortness of breath;

3. TREATMENT

Pharmacological

- Inhaled salbutamol, two puffs as required, up to four times daily;
- if symptoms are still troublesome, consider low-dose oral theophylline;
- if ipratropium inhalers are available, they can be used instead of, or added to, salbutamol, but they are more expensive.

4. REFER

Patient should be referred in the following conditions

- If the symptoms are severe i.e breathlessness at rest
- Non responding to treatment or worsening of respiratory symptoms

5. FOLLLOW UP

Patient and family education should be provided. Ensure that the patients and their family understand that smoking and indoor air pollution are the major risk factors for COPD

6. ACUTE COPD EXACERBATION

An exacerbation of COPD is an acute event characterized by a worsening of the patient’s respiratory symptoms that is beyond normal day-to-day variations and leads to a change in medication.

A. Common symptoms of Acute Exacerbation of COPD

- Cough
- Increase in breathlessness
- Increase in sputum production and increase in sputum purulence
- Chest tightness, wheezing

B. Management of exacerbation of COPD

- antibiotics should be given for all exacerbations;
- for severe exacerbations, give oral prednisolone 30–40mg for around seven days;
- give high doses of inhaled salbutamol by nebulizer or metered dose inhaler with spacer; or by nebulizer;
- oxygen, if available, should be given by a mask that limits the concentration to 24% to 28%

Notes

Activity

Demonstration of use of a peak flowmeter

Notes

Case study 1

A 69 year old male, chronic smoker presented to the primary health center with complaints of progressive breathlessness and wheezing associated with cough with expectoration for the last 8 years.

He is fatigued most of the time and has started to avoid going out for walks He also complains of cough with mucoid expectoration on most days, especially more during the winter seasons.

HISTORY

- He reports that previously, he used to experience breathlessness only on strenuous exercise and did not face any difficulty in going to his room on the second floor.
- However since the past one year, it has progressed to such a state that now while climbing a flight of stairs, he has to often halt to catch his breath.

EXAMINATION

- RR is 18/minute, HR is 90/minute (regular), BP is 138/74mmHg.
- SpO2 is 93%. There is no cyanosis, clubbing or pedal oedema.
- On respiratory system examination:
    - he has a barrel shaped chest
    - auscultation revealed bilateral polyphonic wheezing.

Q. What is the probable diagnosis? How will you manage the patient?

Notes

Case study 2

An 18- year old college student has history of episodic attacks of shortness of breath, dry cough and wheezing for the past 5 years. These symptoms usually occur during change of weather or whenever she catches cold and tend to worsen during night and early morning. She also has history of recurrent sneezing, runny nose and itchy eyes.

- She was advised some inhaler medications by a local health practitioner 2 years ago which she used to take on 'as needed' basis, but has discontinued after few months due to fear of inhaler addiction. Since then, she has been taking cough syrups during these attacks with partial improvement. She has never been hospitalized because of these respiratory complaints.

PERSONAL HISTORY

- Patient does not have fever, hemoptysis or loss of weight. She is unmarried and lives with her parents. Her father is a chronic smoker who smokes around 10 cigarettes per day for 15 years often at home.
- She sometimes helps her mother in kitchen after returning home from college. They frequently use dry wood for cooking. Her mother also had similar problems during childhood

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Case study 3

A 25 year old female with known asthma for 10 years is on inhaler treatment. She was doing well till one year of her last follow up visit.

- One Sunday morning, she started to have dry cough and runny nose associated with low grade fever and generalized body ache. On the same day evening, she also had increasing breathlessness and audible wheeze associated with chest tightness.
- She took two puffs of levosalbutamol inhaler (with spacer) and two teaspoons of cough syrup. As her condition didn’t improve by next day, she was taken to a primary health centre,
- The medical officer in the PHC examines her and tells that she has an acute attack of asthma.
- Her vital parameters were: Pulse 106/min, BP 140/90, RR 22/min, Temperature 100.6 F. Her SPO2 level was 95% in room air. She was having clear nasal discharge with congested pharynx. She was not using accessory muscles for respiration. The doctor could hear extensive wheezes over bilateral lung fields.

Q. What are the points in favour of the diagnosis? How will you manage the patient?

Notes

Case studies with solutions

Case study 1 :

Solution

The features of this case are suggestive of COPD

- He had breathlessness for the last 8 years
- He had history of cough with mucoid expectoration
- He is a current smoker. He has been smoking ~ 20 cigarettes /day for about 50 years.

COPD and its Differential Diagnoses	
Diagnosis	Suggestive features
COPD	Onset in mid-life. Symptoms slowly progressive. History of tobacco smoking or exposure to other types of smoke.
Asthma	Onset early in life (often childhood). Symptoms vary widely from day to day. Symptoms worse at night/early morning. Allergy, rhinitis, and/or eczema may also be present. Family history of asthma may be present
Pulmonary Tuberculosis	Sputum AFB +ve Onset at any age Hemoptysis may be present Chest X-ray may show abnormalities.
Bronchiectasis	Large volumes of purulent sputum. Hemoptysis may be present Commonly associated with bacterial infection. Chest X-ray/CT shows bronchial dilation, bronchial wall thickening.

- In the absence of spirometry, based on the presence of risk factors, clinical findings and absence of atypical features of COPD, after ruling out alternative diagnosis, a provisional diagnosis of COPD may be made.
- Spirometry remains the Gold standard and should be performed in all patients suspected of having COPD.

TREATMENT

- Inhaled salbutamol, two puffs as required, up to four times daily;
- if symptoms are still troublesome, consider low-dose oral theophylline;

FOLOW UP

Once treatment has been optimised, the patient may be asked to follow up at primary health care level at least

- every 3-6 month (mild to moderate disease) or
- every 1-3 month (severe disease).

The points to be assessed during follow up visits should be:

- Inhaler technique and compliance to medications
- Smoking status / efforts at cessation
- Management of symptoms and their impact on daily activities
- Frequency of exacerbations
- Presence of comorbidities and complications
- Efficacy of medications and need to modify the therapy
- Assess for hypoxia using pulse oximetry

Case study 2

Solution

Patient has **cardinal symptoms of asthma** which are of variable frequency and intensity along with a **strong family history**

- These features support the diagnosis of asthma
- TREATMENT
- **Step 1.** Inhaled salbutamol prn
- **Step 2.** Inhaled salbutamol prn plus low-dose inhaled beclometasone, starting with 100ug twice daily for adults
- **Step 3.** Same as step 2, but give higher doses of inhaled beclometasone, 200ug or 400ug twice daily

Case study 3

Solution

Diagnosis: A ***case of acute exacerbation of asthma.***

What does the doctor mean by acute asthma attack?

- The patient's clinical presentation is suggestive of acute exacerbation of asthma which is characterized by acute worsening of one or more of the asthma symptoms (cough, wheezing, chest tightness, dyspnea), leading either to increased need for rescue medications or hospitalization.

How severe is her asthma exacerbation?

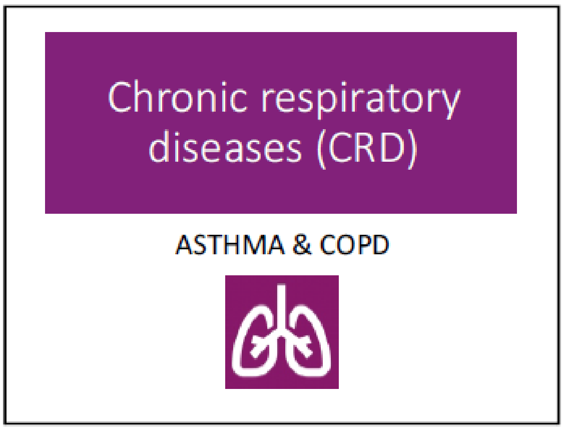
- The patient has a non-severe (mild) exacerbation, likely precipitated by viral upper respiratory tract infection.

Management of asthma exacerbation

- Salbutamol in high doses by metered dose inhaler and spacer (e.g. four puffs every 20 minutes for one hour) or by nebulizer;
- Prednisolone 30–40mg for five days for adults or longer until they have recovered;
- Oxygen , if available, if O2 saturation levels are below 90%

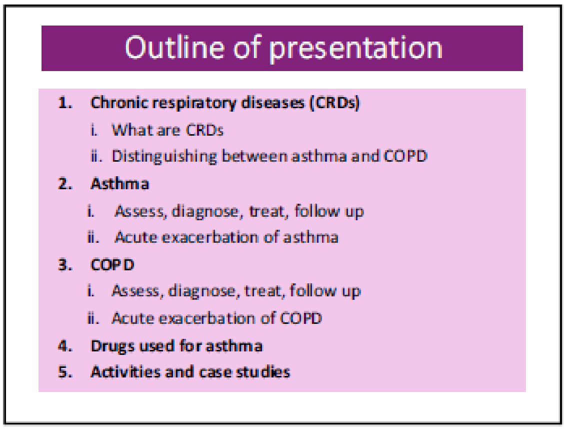
(Follow the protocol discussed)

Presentation -



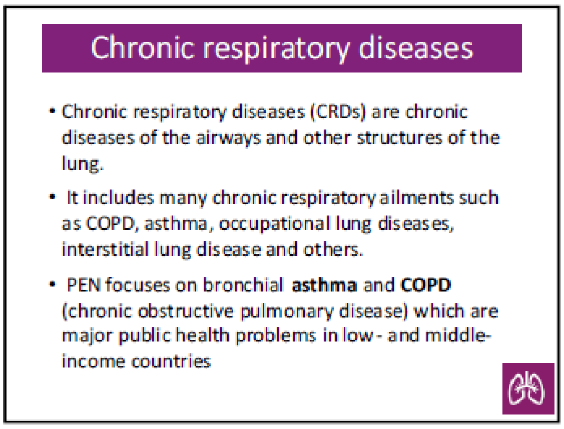
Chronic respiratory diseases (CRD)

ASTHMA & COPD



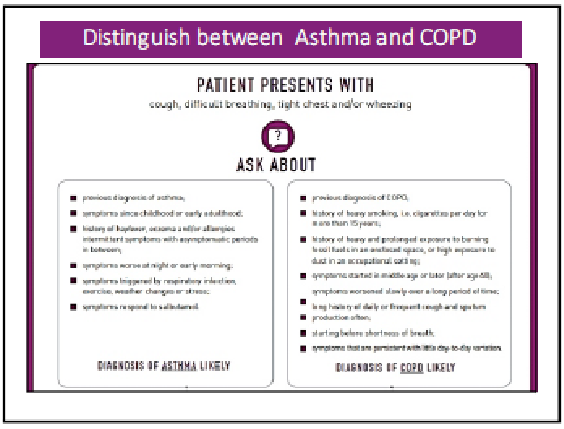
Outline of presentation

1. **Chronic respiratory diseases (CRDs)**
    i. What are CRDs
    ii. Distinguishing between asthma and COPD
2. **Asthma**
    i. Assess, diagnose, treat, follow up
    ii. Acute exacerbation of asthma
3. **COPD**
    i. Assess, diagnose, treat, follow up
    ii. Acute exacerbation of COPD
4. **Drugs used for asthma**
5. **Activities and case studies**



Chronic respiratory diseases

- Chronic respiratory diseases (CRDs) are chronic diseases of the airways and other structures of the lung.
- It includes many chronic respiratory ailments such as COPD, asthma, occupational lung diseases, interstitial lung disease and others.
- PEN focuses on bronchial **asthma** and **COPD** (chronic obstructive pulmonary disease) which are major public health problems in low- and middle-income countries



Distinguish between Asthma and COPD

PATIENT PRESENTS WITH

cough, difficult breathing, tight chest and/or wheezing

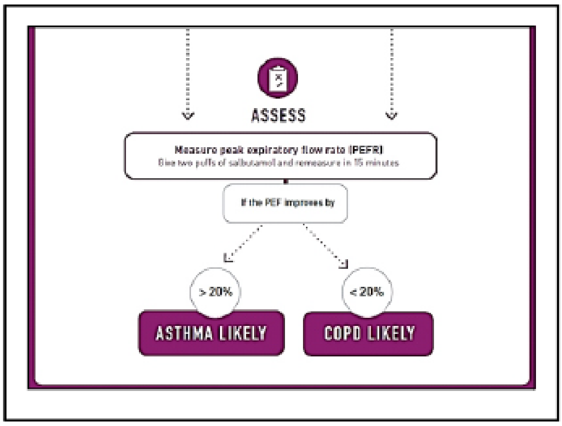
ASK ABOUT

- previous diagnosis of asthma;
- symptoms since childhood or early adulthood;
- history of hayfever, eczema and/or allergies; intermittent symptoms with asymptomatic periods in between;
- symptoms worse at night or early morning;
- symptoms triggered by respiratory infection, exercise, weather changes or stress;
- symptoms respond to salbutamol.

DIAGNOSIS OF ASTHMA LIKELY

- previous diagnosis of COPD;
- history of heavy smoking, i.e. cigarettes per day for more than 15 years;
- history of heavy and prolonged exposure to burning fossil fuels in an enclosed space, or high exposure to dust in an occupational setting;
- symptoms started in middle age or later (after age 40);
- symptoms worsened slowly over a long period of time;
- long history of daily or frequent cough and sputum production often,
- starting before shortness of breath;
- symptoms that are persistent with little day-to-day variation.

DIAGNOSIS OF COPD LIKELY



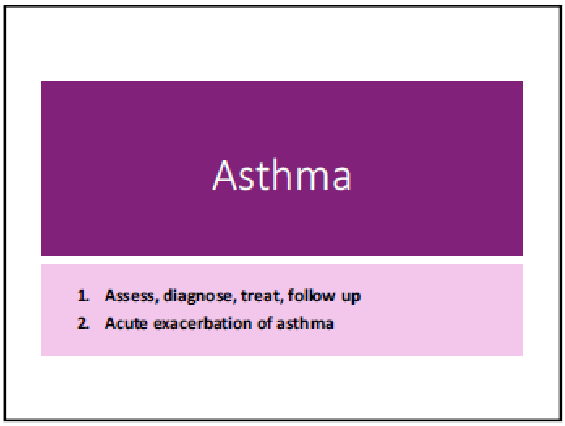
ASSESS

Measure peak expiratory flow rate (PEFR)
Give two puffs of salbutamol and remeasure in 15 minutes

If the PEF improves by

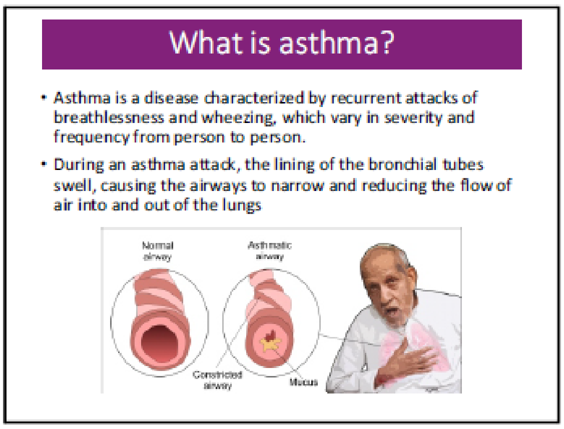
> 20% → ASTHMA LIKELY

< 20% → COPD LIKELY



Asthma

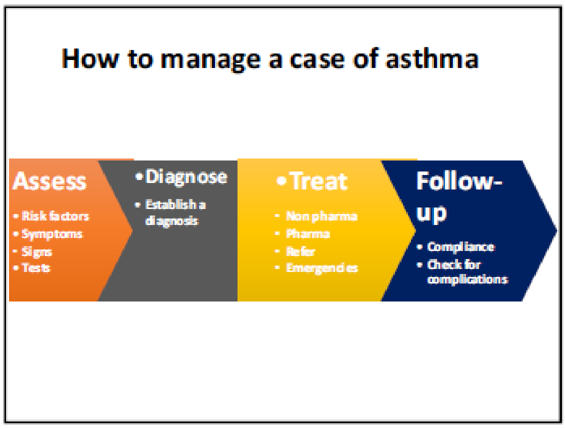
1. **Assess, diagnose, treat, follow up**
2. **Acute exacerbation of asthma**



What is asthma?

- Asthma is a disease characterized by recurrent attacks of breathlessness and wheezing, which vary in severity and frequency from person to person.
- During an asthma attack, the lining of the bronchial tubes swell, causing the airways to narrow and reducing the flow of air into and out of the lungs

Normal airway
Asthmatic airway
Constricted airway
Mucus



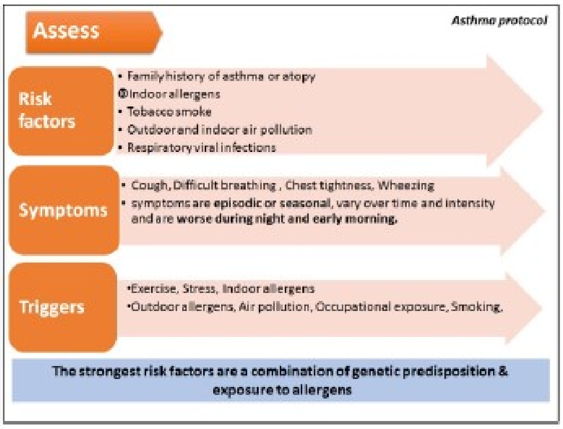
How to manage a case of asthma

Assess
- Risk factors
- Symptoms
- Signs
- Tests

- **Diagnose**
    - Establish a diagnosis

- **Treat**
    - Non pharma
    - Pharma
    - Refer
    - Emergencies

Follow-up
- Compliance
- Check for complications



Assess

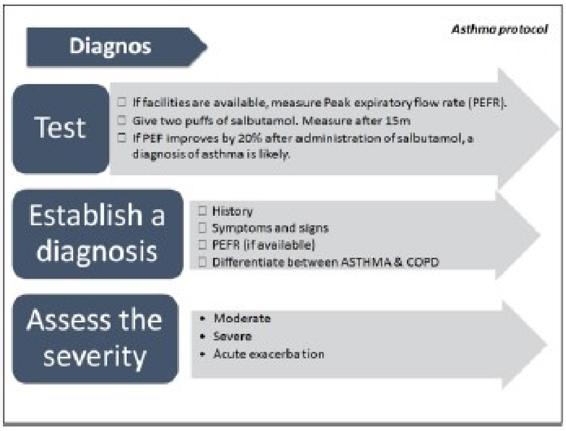
Asthma protocol

Risk factors
- Family history of asthma or atopy
- Indoor allergens
- Tobacco smoke
- Outdoor and indoor air pollution
- Respiratory viral infections

Symptoms
- Cough, Difficult breathing , Chest tightness, Wheezing
- symptoms are **episodic or seasonal**, vary over time and intensity and are **worse during night and early morning.**

Triggers
- Exercise, Stress, Indoor allergens
- Outdoor allergens, Air pollution, Occupational exposure, Smoking.

The strongest risk factors are a combination of genetic predisposition & exposure to allergens



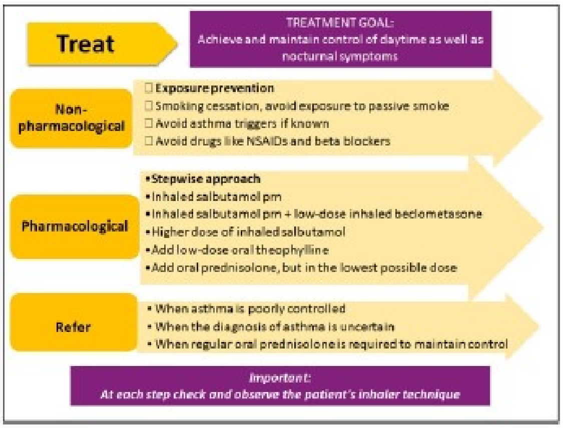
Diagnos

Asthma protocol

Test
- ☐ If facilities are available, measure Peak expiratory flow rate (PEFR).
- ☐ Give two puffs of salbutamol. Measure after 15m
- ☐ If PEF improves by 20% after administration of salbutamol, a diagnosis of asthma is likely.

Establish a diagnosis
- ☐ History
- ☐ Symptoms and signs
- ☐ PEFR (if available)
- ☐ Differentiate between ASTHMA & COPD

Assess the severity
- Moderate
- Severe
- Acute exacerbation



Treat

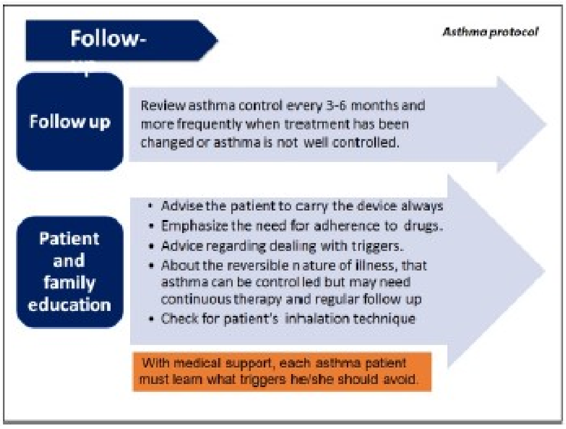
TREATMENT GOAL:
Achieve and maintain control of daytime as well as nocturnal symptoms

Non-pharmacological
- ☐ **Exposure prevention**
- ☐ Smoking cessation, avoid exposure to passive smoke
- ☐ Avoid asthma triggers if known
- ☐ Avoid drugs like NSAIDs and beta blockers

Pharmacological
- **Stepwise approach**
- Inhaled salbutamol pm
- Inhaled salbutamol pm + low-dose inhaled beclometasone
- Higher dose of inhaled salbutamol
- Add low-dose oral theophylline
- Add oral prednisolone, but in the lowest possible dose

Refer
- When asthma is poorly controlled
- When the diagnosis of asthma is uncertain
- When regular oral prednisolone is required to maintain control

Important:
At each step check and observe the patient's inhaler technique



Follow-

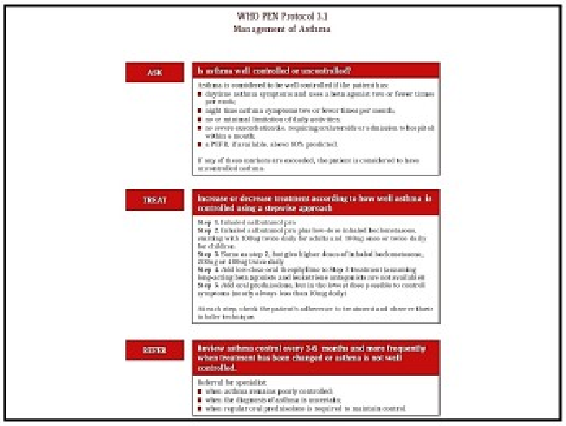
Asthma protocol

Follow up

Review asthma control every 3-6 months and more frequently when treatment has been changed or asthma is not well controlled.

Patient and family education
- Advise the patient to carry the device always
- Emphasize the need for adherence to drugs.
- Advice regarding dealing with triggers.
- About the reversible nature of illness, that asthma can be controlled but may need continuous therapy and regular follow up
- Check for patient's inhalation technique

With medical support, each asthma patient must learn what triggers he/she should avoid.



WHO PEN Protocol 3.1
Management of Asthma

ASK

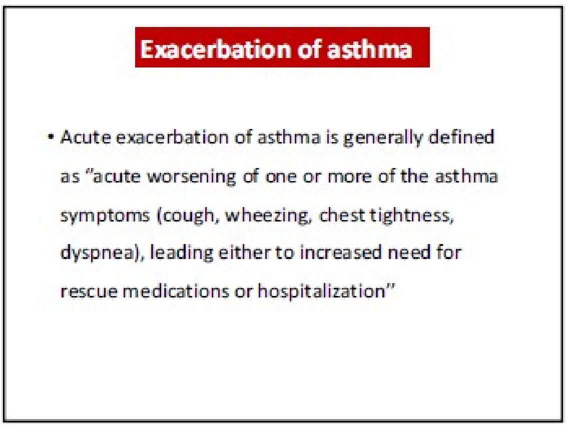
Is asthma well controlled or uncontrolled?

TREAT

Increase or decrease treatment according to how well asthma is controlled using a stepwise approach

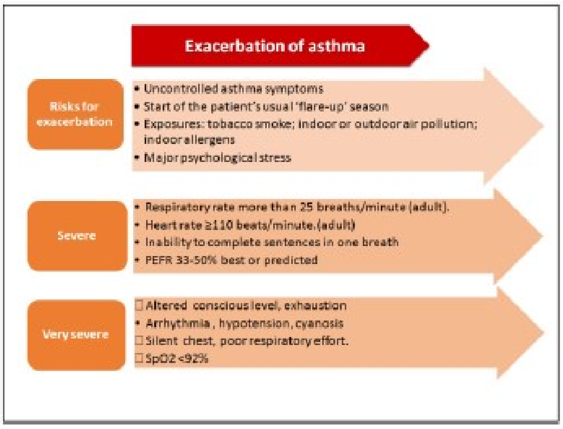
REFER

Review asthma control every 3-6 months and more frequently when treatment has been changed or asthma is not well controlled.



Exacerbation of asthma

- Acute exacerbation of asthma is generally defined as "acute worsening of one or more of the asthma symptoms (cough, wheezing, chest tightness, dyspnea), leading either to increased need for rescue medications or hospitalization"

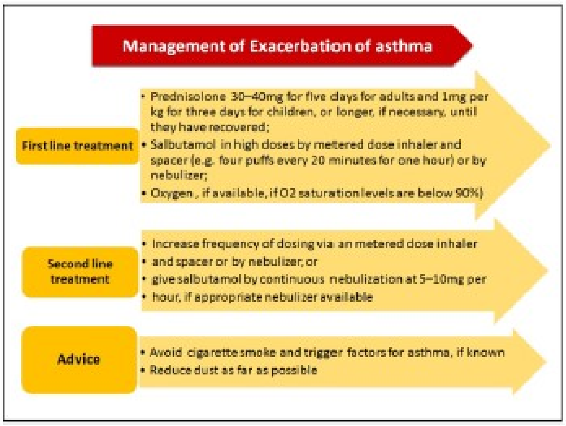


Exacerbation of asthma

Risks for exacerbation
- Uncontrolled asthma symptoms
- Start of the patient's usual 'flare-up' season
- Exposures: tobacco smoke; indoor or outdoor air pollution; indoor allergens
- Major psychological stress

Severe
- Respiratory rate more than 25 breaths/minute (adult).
- Heart rate ≥110 beats/minute.(adult)
- Inability to complete sentences in one breath
- PEFR 33-50% best or predicted

Very severe
- ☐ Altered conscious level, exhaustion
- Arrhythmia , hypotension, cyanosis
- ☐ Silent chest, poor respiratory effort.
- ☐ SpO2 <92%



Management of Exacerbation of asthma

First line treatment
- Prednisolone 30–40mg for five days for adults and 1mg per kg for three days for children, or longer, if necessary, until they have recovered;
- Salbutamol in high doses by metered dose inhaler and spacer (e.g. four puffs every 20 minutes for one hour) or by nebulizer;
- Oxygen , if available, if O2 saturation levels are below 90%)

Second line treatment
- Increase frequency of dosing via an metered dose inhaler
- and spacer or by nebulizer, or
- give salbutamol by continuous nebulization at 5–10mg per
- hour, if appropriate nebulizer available

Advice
- Avoid cigarette smoke and trigger factors for asthma, if known
- Reduce dust as far as possible

Points to remember ..

- Asthma is a chronic disease of the air passages of the lungs which inflames and narrows them.
- The strongest risk factors for developing asthma are inhaled allergens
- Medication (salbutamol) can control asthma.
- Avoiding asthma triggers can also reduce the severity of asthma.
- Appropriate management of asthma can enable people to enjoy a good quality of life.

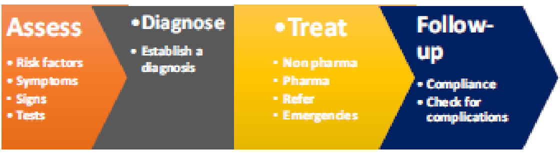
Chronic obstructive pulmonary disease (COPD)

1. **Assess, diagnose, treat, follow up**
2. **Acute exacerbation of COPD**

What is COPD?

- **Chronic obstructive pulmonary disease (COPD) is a progressive life threatening lung disease that causes breathlessness (initially with exertion) and predisposes to exacerbations and serious illness**

How to manage a case of COPD



Assess
- Risk factors
- Symptoms
- Signs
- Tests

Diagnose
- Establish a diagnosis

Treat
- Non pharma
- Pharma
- Refer
- Emergencies

Follow-up
- Compliance
- Check for complications

Assess

COPD protocol

Risk factors
- Tobacco smoking in all forms
- Outdoor air pollution
- Pulmonary TB
- Poorly treated asthma
- Environmental tobacco smoke, Occupational exposure
- **Exposure to biomass fuel smoke**

Symptoms suggestive of COPD
- ☐ Progressive difficulty in breathing
- Chronic cough
- Chronic sputum production

The primary cause of COPD is tobacco smoke (including second--hand or passive exposure).

Diagnose

COPD protocol

Test
- ☐ If facilities are available, measure Peak expiratory flow rate (PEFR).
- ☐ Give two puffs of salbutamol. Measure after 15m
- ☐ If improvement in PEF is small - less than 20% after administration of salbutamol, a diagnosis COPD is likely.

Establish a diagnosis
- ☐ History
- ☐ Symptoms and signs
- ☐ PEFR (if available)
- ☐ Differentiate between ASTHMA & COPD

Assess the severity
- Moderate - if breathless with normal activity
- Severe - if breathless at rest
- Measure PEFR and oxygen saturation, if possible

Treat

TREATMENT GOAL: relieve symptoms, improve exercise capacity and quality of life

COPD protocol

Non-pharmacological
- ☐ Exposure prevention
- ☐ Patients with COPD must stop smoking and avoid dust and tobacco smoke;
- ☐ Promoting use of safer fuels instead of biomass fuels
- ☐ Avoid working in areas with occupational dust or high air pollution

Pharmacological
- Inhaled salbutamol, two puffs as required, up to four times daily;
- If symptoms are still troublesome, consider low-dose oral theophylline;
- If ipratropium inhalers are available, they can be used instead of, or added to, salbutamol

Indications for referral
- If the symptoms are severe i.e breathlessness at rest
- Non response to treatment or worsening of respiratory symptoms

Important:
Check and observe the patient's inhaler technique

Follow-up

COPD protocol

Follow up

Review every 3-6 months and more frequently when treatment has been changed or symptoms are not well controlled.

Patient and family education
- Stop smoking and avoid dust and tobacco smoke;
- Keep the area where meals are cooked well ventilated
- Cook with wood or carbon outside the house, if indoor cooking have smoke outlet
- If possible, stop working in areas with occupational dust or high air pollution

COPD is not curable, but treatment can relieve symptoms, improve quality of life and reduce the risk of death

WHO PEN Protocol 3.2
Management of Chronic Obstructive Pulmonary Disease

ASSESS

Assess severity

Moderate - if breathless with normal activity

Severe - if breathless at rest

Measure PEFR and oxygen saturation, if possible.

TREAT

- inhaled salbutamol, two puffs as required, up to four times daily;
- if symptoms are still troublesome, consider low-dose oral theophylline;
- if ipratropium inhalers are available, they can be used instead of, or added to, salbutamol, but they are more expensive.

ADVICE

COPD - Advice to patients and families

- ensure they understand that smoking and indoor air pollution are the major risk factors for COPD – therefore, patients with COPD must stop smoking and avoid dust and tobacco smoke;
- keep the area where meals are cooked well ventilated by opening windows and doors;
- cook with wood or carbon outside the house, if possible, or build an oven in the kitchen with a chimney that vents the smoke outside;
- stop working in areas with occupational dust or high air pollution – using a mask may help, but it needs to have an appropriate design and provide adequate respiratory protection.

Acute Exacerbation of COPD

- An exacerbation of COPD is an acute event characterized by a **worsening** of the patient's respiratory symptoms that is beyond normal day-to-day variations and leads to a change in medication

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Acute Exacerbation of COPD

Assess

Symptoms

- ☐ Cough
- ☐ Increase in breathlessness
- ☐ Increase in sputum production and increase in sputum purulence
- ☐ Chest tightness, wheezing

Triggers

- ☐ Poorly controlled asthma
- ☐ Air pollution
- ☐ Smoking
- ☐ Occupational exposure

Treatment of Acute Exacerbation of COPD

Management of Acute Exacerbation

- **Antibiotics** should be given for all exacerbations;
- For severe exacerbations, give oral prednisolone 30–40mg for around seven days;
- Give **high doses of inhaled salbutamol** by nebulizer or metered dose inhaler with spacer; or by nebulizer;
- Oxygen should be given by a mask

Indications for hospitalization

- Cyanosis
- Systolic blood pressure <90 mmHg
- RR >30/min
- HR >110/minute
- Pulse oximetry - SpO2<90%
- Altered sensorium
- Presence of severe co-morbid conditions
- (e.g. heart failure, arrhythmia.)

Points to remember ..

- ***COPD*** is a common, preventable lung disorder characterized by progressive, poorly reversible airflow limitation
- **The primary cause of COPD is exposure to tobacco smoke (either active smoking or second-hand smoke)**
- For women- exposure to **indoor air pollution** (such as solid fuel used for cooking and heating)
- **Many cases of COPD are preventable by avoidance or early cessation of smoking.**

Drugs used
for
Asthma & COPD

Drugs used for asthma & COPD

Short-Acting Beta-Agonists (SABAs):

- Are typically used as "rescue" medications to provide quick relieve of asthma symptoms.
- Includes : salbutamol, terbutaline, levosalbutamol
- Effect of inhaled form
  - Onset : 1-5minutes
  - Duration : 3-6 hours

Long-Acting Beta-Agonists:

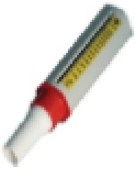
Includes Theophylline

Side effects of common drugs

Drug	Possible side effects
Salbutamol	Tremor, Tachycardia
Theophylline	Nausea, Vomiting, Tachycardia
Prednisolone	Gastritis, high blood glucose, high blood pressure, swelling of face and obesity
Inhaled steroids	Oral thrush, hoarseness

Activities
and
case studies

Peak flow meter



- A peak flow meter is a small device that helps to monitor respiratory conditions such as asthma
- It measures maximum airflow out of the lungs.
- Peak flow meters are most helpful in assessing moderate to severe persistent asthma.
- It is helpful to distinguish between asthma and COPD

How to use a peak flow meter

- Move the marker to the bottom of the numbered scale.
- Stand up straight. Take a deep breath.
- Hold your breath while you place the mouthpiece in your mouth, between your teeth. Close your lips around it. DO NOT put your tongue against or inside the hole.
- **Blow out as hard and fast as** you can in a single blow.
- **Write down** the number you get.
- Move the marker back to the bottom and repeat all these steps 2 more times.
- The highest of the 3 numbers is your peak flow number. Write it down in your log chart.

If you coughed or did not do the steps right, do not write down the number. Instead, do the steps over again

Case study - 1

- A 69 year old male, chronic smoker presented to the primary health center with complaints of progressive breathlessness and wheezing associated with cough with expectoration for the last 8 years.
- He is fatigued most of the time and has started to avoid going out for walks He also complains of cough with mucoid expectoration on most days, especially more during the winter seasons.

WHAT IS YOUR PROBABLE DIAGNOSIS ?

Case study – 1 (contd)

HISTORY

- He reports that previously, he used to experience breathlessness only on strenuous exercise and did not face any difficulty in going to his room on the second floor.
- However since the past one year, it has progressed to such a state that now while climbing a flight of stairs, he has to often halt to catch his breath.

EXAMINATION

- RR is 18/minute, HR is 90/minute (regular), BP is 138/74mmHg.
- SpO2 is 93%. There is no cyanosis, clubbing or pedal oedema.
- On respiratory system examination:
  - he has a barrel shaped chest
  - auscultation revealed bilateral polyphonic wheezing.

Case study – 1 (contd)

Symptoms suggestive of COPD	
Progressive Dyspnea	*He had breathlessness for the last 8 years*
Chronic cough, Chronic sputum production	*He had history of cough with mucoid expectoration*
Risk factors : Tobacco smoke	*He is a current smoker. He has been smoking ~ 20 cigarettes/day for about 50 years.*

Signs	
Features of Hyperinflation	The patient had a barrel shaped chest
Features of Airflow obstruction	He had bilateral polyphonic wheezing

The features of this case are suggestive of COPD.

Case study – 1 (contd)

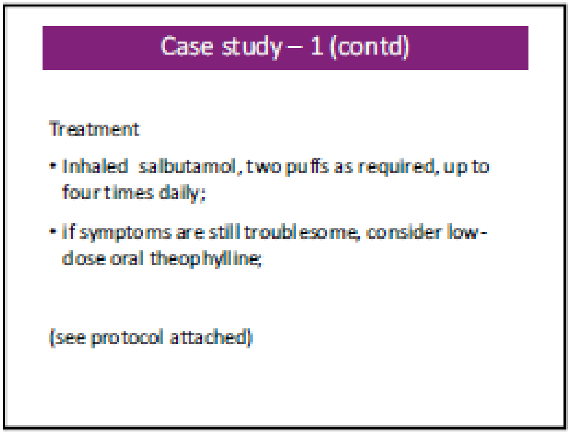
COPD and its Differential Diagnoses

Diagnosis	Suggestive features
COPD	Onset in mid-life. Symptoms slowly progressive. History of tobacco smoking or exposure to other types of smoke.
Asthma	Onset early in life (often childhood). Symptoms vary widely from day to day. Symptoms worse at night/early morning. Allergy, rhinitis, and/or eczema may also be present. Family history of asthma may be present
Pulmonary Tuberculosis	Sputum AFB +ve Onset at any age Hemoptysis may be present Chest X-ray may show abnormalities.
Bronchiectasis	Large volumes of purulent sputum. Hemoptysis may be present Commonly associated with bacterial infection. Chest X-ray/CT shows bronchial dilation, bronchial wall thickening.

Case study – 1 (contd)

CONFIRMING THE DIAGNOSIS

- In the absence of spirometry, based on the presence of risk factors, clinical findings and absence of atypical features of COPD, after ruling out alternative diagnosis, a **provisional diagnosis** of COPD may be made.
- **Spirometry remains the Gold standard** and should be performed in all patients suspected of having COPD.

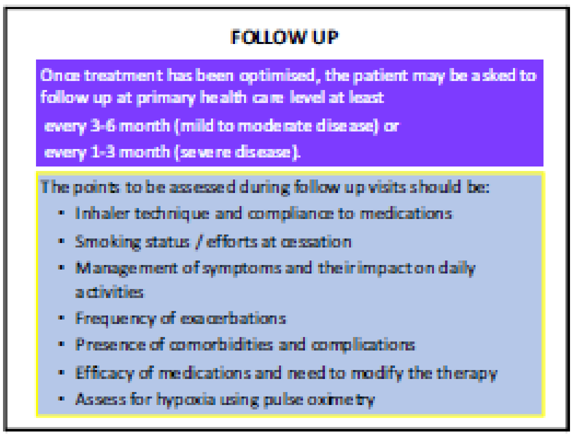


Case study – 1 (contd)

Treatment

- Inhaled salbutamol, two puffs as required, up to four times daily;
- if symptoms are still troublesome, consider low-dose oral theophylline;

(see protocol attached)



FOLLOW UP

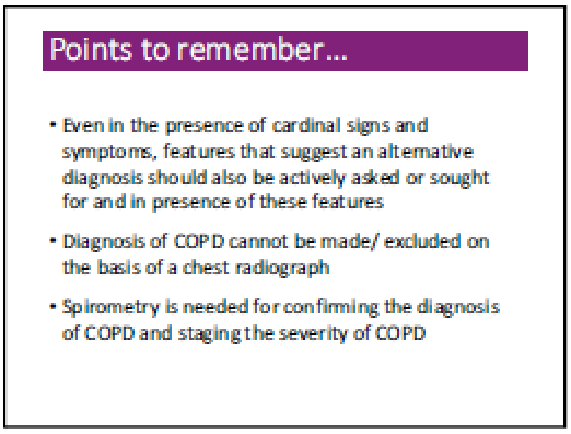
Once treatment has been optimised, the patient may be asked to follow up at primary health care level at least

every 3-6 month (mild to moderate disease) or

every 1-3 month (severe disease).

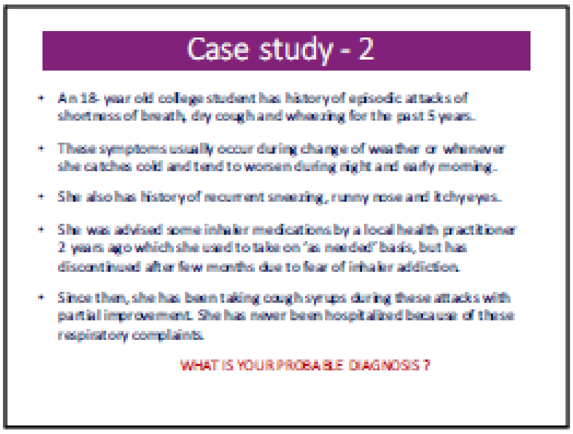
The points to be assesed during follow up visits should be:

- Inhaler technique and compliance to medications
- Smoking status / efforts at cessation
- Management of symptoms and their impact on daily activities
- Frequency of exacerbations
- Presence of comorbidities and complications
- Efficacy of medications and need to modify the therapy
- Assess for hypoxia using pulse oximetry



Points to remember…

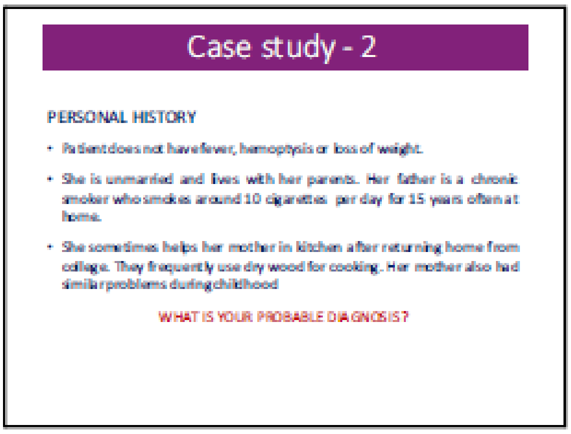
- Even in the presence of cardinal signs and symptoms, features that suggest an alternative diagnosis should also be actively asked or sought for and in presence of these features
- Diagnosis of COPD cannot be made/ excluded on the basis of a chest radiograph
- Spirometry is needed for confirming the diagnosis of COPD and staging the severity of COPD



Case study - 2

- An 18- year old college student has history of episodic attacks of shortness of breath, dry cough and wheezing for the past 5 years.
- These symptoms usually occur during change of weather or whenever she catches cold and tend to worsen during night and early morning.
- She also has history of recurrent sneezing, runny nose and itchy eyes.
- She was advised some inhaler medications by a local health practitioner 2 years ago which she used to take on 'as needed' basis, but has discontinued after few months due to fear of inhaler addiction.
- Since then, she has been taking cough syrups during these attacks with partial improvement. She has never been hospitalized because of these respiratory complaints.

WHAT IS YOUR PROBABLE DIAGNOSIS ?

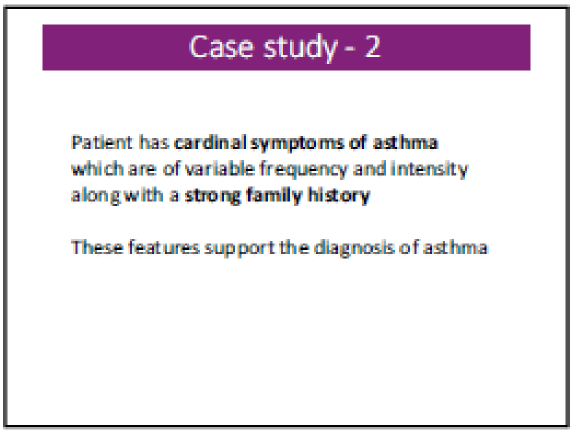


Case study - 2

PERSONAL HISTORY

- Patient does not have fever, hemoptysis or loss of weight.
- She is unmarried and lives with her parents. Her father is a chronic smoker who smokes around 10 cigarettes per day for 15 years often at home.
- She sometimes helps her mother in kitchen after returning home from college. They frequently use dry wood for cooking. Her mother also had similar problems during childhood

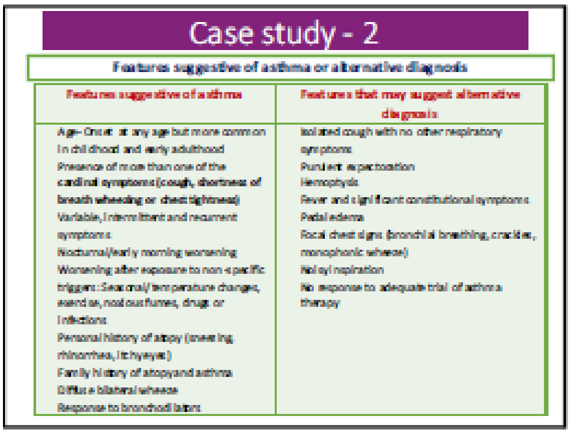
WHAT IS YOUR PROBABLE DIAGNOSIS?



Case study - 2

Patient has **cardinal symptoms of asthma** which are of variable frequency and intensity along with a **strong family history**

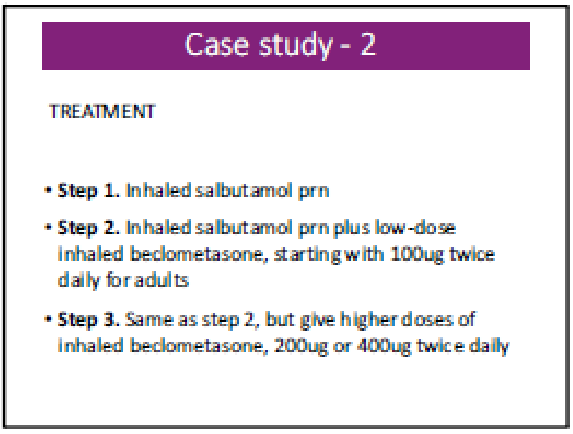
These features support the diagnosis of asthma



Case study - 2

Features suggestive of asthma or alternative diagnosis

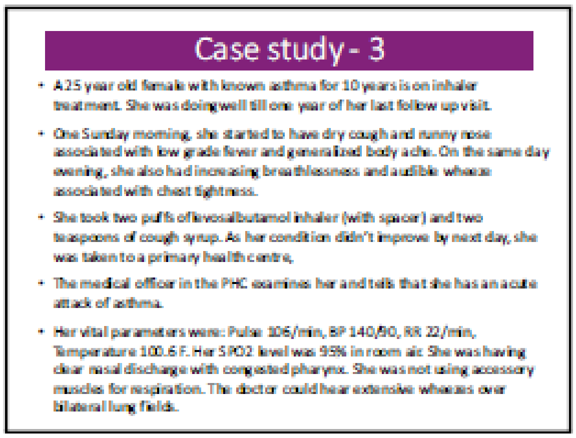
Features suggestive of asthma	Features that may suggest alternative diagnosis
Age- Onset at any age but more common In childhood and early adulthood Presence of more than one of the **cardinal symptoms (cough, shortness of breath wheezing or chest tightness)** Variable, Intermittent and recurrent symptoms Nocturnal/early morning worsening Worsening after exposure to non-specific triggers: Seasonal/temperature changes, exercise, noxious fumes, drugs or infections Personal history of atopy (sneezing, rhinorrhea, itchy eyes) Family history of atopy and asthma Diffuse bilateral wheeze Response to bronchodilators	Isolated cough with no other respiratory symptoms Purulent expectoration Hemoptysis Fever and significant constitutional symptoms Pedal edema Focal chest signs (bronchial breathing, crackles, monophonic wheeze) Noisy inspiration No response to adequate trial of asthma therapy



Case study - 2

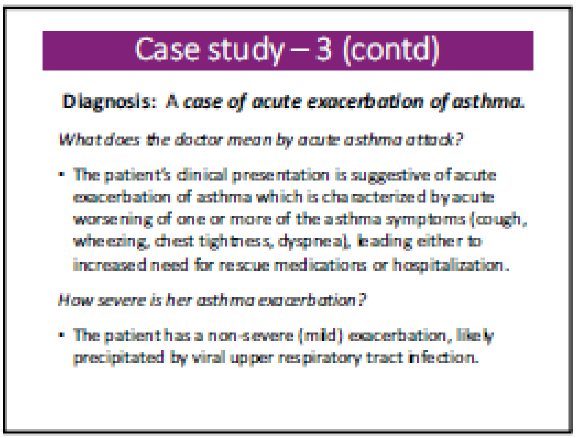
TREATMENT

- **Step 1.** Inhaled salbutamol prn
- **Step 2.** Inhaled salbutamol prn plus low-dose inhaled beclometasone, starting with 100ug twice daily for adults
- **Step 3.** Same as step 2, but give higher doses of inhaled beclometasone, 200ug or 400ug twice daily



Case study - 3

- A 25 year old female with known asthma for 10 years is on inhaler treatment. She was doing well till one year of her last follow up visit.
- One Sunday morning, she started to have dry cough and runny nose associated with low grade fever and generalized body ache. On the same day evening, she also had increasing breathlessness and audible wheeze associated with chest tightness.
- She took two puffs of levosalbutamol inhaler (with spacer) and two teaspoons of cough syrup. As her condition didn't improve by next day, she was taken to a primary health centre,
- The medical officer in the PHC examines her and tells that she has an acute attack of asthma.
- Her vital parameters were: Pulse 106/min, BP 140/90, RR 22/min, Temperature 100.6 F. Her SPO2 level was 95% in room air. She was having clear nasal discharge with congested pharynx. She was not using accessory muscles for respiration. The doctor could hear extensive wheezes over bilateral lung fields.



Case study – 3 (contd)

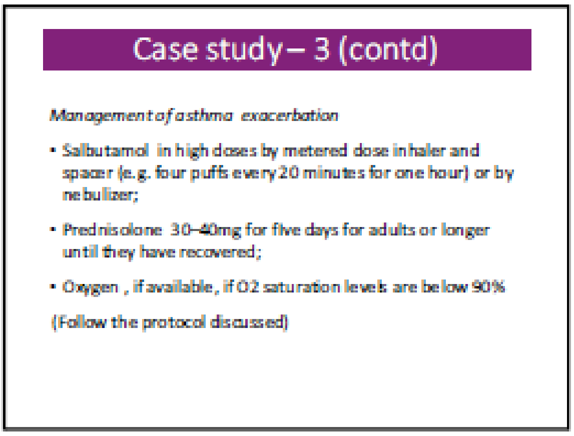
Diagnosis: ***A case of acute exacerbation of asthma.***

What does the doctor mean by acute asthma attack?

- The patient's clinical presentation is suggestive of acute exacerbation of asthma which is characterized by acute worsening of one or more of the asthma symptoms (cough, wheezing, chest tightness, dyspnea), leading either to increased need for rescue medications or hospitalization.

How severe is her asthma exacerbation?

- The patient has a non-severe (mild) exacerbation, likely precipitated by viral upper respiratory tract infection.



Case study – 3 (contd)

Management of asthma exacerbation

- Salbutamol in high doses by metered dose inhaler and spacer (e.g. four puffs every 20 minutes for one hour) or by nebulizer;
- Prednisolone 30–40mg for five days for adults or longer until they have recovered;
- Oxygen , if available, if O2 saturation levels are below 90%

(Follow the protocol discussed)

Notes

Training manual

WHO Package of Essential NCD Interventions (PEN)

Management of
Chronic Respiratory Diseases.